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2008 MICHIGAN FURBEARER HARVEST SURVEY

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ABSTRACT

A sample of furtakers was contacted after the 2008 hunting and trapping seasons to estimate the number of participants, days afield (effort), and furbearer harvests. In 2008, 24,071 people purchased a fur harvester license, which was 1% lower than in 2007. In 2008, about 13,776 license buyers either hunted or trapped furbearers. About 31% of the license buyers trapped (7,478 trappers), 40% hunted (9,529 hunters), and 13% (3,231) both trapped and hunted. Overall trapper and hunter numbers were nearly unchanged between 2007 and 2008. Significantly fewer trappers pursued mink in 2008, compared to 2007. In addition, significantly fewer hunters pursued bobcats; however, significantly more trappers sought bobcats. Changes for hunting and trapping effort and harvest between 2007 and 2008 generally followed changes in the number of furtakers. Hunters most commonly sought coyotes, raccoons, and red fox, while trappers most frequently sought raccoons, muskrats, and coyotes. Trends in harvest can be affected by both changes in furtaker and furbearer numbers; thus, harvest per furtaker was examined for trends. The mean number of raccoon and opossum taken per furtaker has increased since the 1980s. The mean harvest of red fox by both hunters and trappers has declined since the mid-1980s. These trends suggest raccoon and opossum may have been increasing in abundance during the last 20 years, while red fox numbers may have been declining. Foothold traps were the most common type of trap used by trappers in 2008; about 80% of trappers used foothold traps. About 71% of trappers used body-gripping traps, 15% of trappers used cable restraints, and 9% of trappers used colony traps.

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INTRODUCTION

The Natural Resources Commission and the Michigan Department of Natural Resources (DNR) have the authority and responsibility to protect and manage the wildlife resources of the state of Michigan. Harvest surveys are one of the management tools used by the DNR to accomplish this statutory responsibility. Estimating harvests and hunter participation are primary objectives of these surveys. Information from harvest surveys, mandatory registration, and other indices are used to monitor furbearer populations and help establish harvest regulations.

The primary furbearing animals harvested for their pelts in Michigan during recent years have been badger (*Taxidea taxus*), beaver (*Castor canadensis*), bobcat (*Felis rufus*), coyote (*Canis latrans*), fisher (*Martes pennanti*), gray fox (*Urocyon cinereoargenteus*), marten (*Martes americana*), mink (*Mustela vision*), muskrat (*Ondatra zibethica*), opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), river otter (*Lontra canadensis*), striped skunk (*Mephitis mephitis*), and weasels (*Mustela* spp.) (Frawley 2008a). Opossum, weasels, and skunks could be taken year-round with any hunting or fur harvester license. The remaining furbearers could be harvested in 2008 during late fall through winter by a person possessing a fur harvesters license (included Fur Harvester, Junior Fur Harvester, Senior Fur Harvester, Non-resident Fur Harvester, Military Fur Harvester, Resident Fur [trap only], and Junior Fur [trap only]) (Table 1). Landowners or their designees could take raccoons and coyotes throughout the year on their property without a license if these animals were doing or about to do damage. Coyotes can also be taken by hunters possessing a small game hunting license. Thus, harvest estimates of coyotes, raccoons, opossum, skunks, and weasels from this survey do not represent all possible forms of harvest, but only those taken by people with a fur harvester's license.

METHODS

Following the 2008 hunting and trapping seasons, a questionnaire was sent to a random sample of people (4,196) who had purchased a fur harvester license (Table 2). All licensees had an equal chance of being included in the random sample. After the sample was selected, licensees were grouped into one of four strata on the basis of their residence. These strata included residents of the Upper Peninsula (UP), Northern Lower Peninsula (NLP), Southern Lower Peninsula (SLP), and nonresidents (Figure 1). People receiving the questionnaire were asked to report whether they pursued furbearers, number of days spent afield, and whether they harvested any furbearing animals.

Estimates were calculated using a stratified random sampling design (Cochran 1977). Using stratification, furtakers were placed into similar groups (strata) based on their county of residence. Residents of the UP, NLP, SLP, and nonresidents and licensees with unknown residency were grouped into separate strata (Figure 1). The overall sample consisted of 586 people from the UP stratum (N= 3,347), 847 people from the NLP stratum (N= 4,760), 2,739 from the SLP stratum (N= 15,795), and 24 people from the nonresident and unknown residency stratum (N=169). Estimates were derived for each group separately. The statewide estimate was then derived by combining group estimates so the influence of each

group matched the proportion its members occurred in the statewide population of furtakers. The primary reason for using a stratified sampling design was to produce more precise estimates. Improved precision means similar estimates should be obtained if this survey were to be repeated.

Estimates were subject to both sampling and nonsampling error. When a sample rather than the entire population has been surveyed, there is a chance that the sample estimates may differ from the true population values they represent. The difference, or sampling error, varies depending on the particular sample selected, and this variability was measured by the 95% confidence limit (CL). In theory, this CL can be added and subtracted from the estimate to calculate the 95% confidence interval. The confidence interval was a measure of the precision associated with the estimate and implies the true value would be within this interval 95 times out of 100.

Estimates also were affected by nonsampling error. Nonsampling error can occur for many reasons, including the failure to include a segment of the survey population, the inability to obtain data from all units in the sample, the inability or unwillingness of respondents to provide data, mistakes made by respondents, and errors made in the collection or processing of the data. It is very difficult to measure this error. Thus, estimates were not adjusted for nonsampling error. Furthermore, harvest estimates did not include animals taken legally outside the open season (e.g., nuisance animals).

Statistical tests are used routinely to determine the likelihood the differences among estimates are larger than expected by chance alone. The overlap of 95% confidence intervals was used to determine whether estimates differed. Non-overlapping 95% confidence intervals was equivalent to stating the difference between the means was larger than would be expected 995 out of 1,000 times ($P < 0.005$), if the study had been repeated (Payton et al. 2003).

Estimates of events that occur infrequently are difficult to estimate precisely using common sampling designs (Cochran 1977). Relatively few furtakers harvest river otter, bobcat, badger, fisher, and marten; thus, some estimates associated with these species should be viewed cautiously. More precise harvest estimates were probably obtained for these species through tallying registration reports. All furtakers harvesting a river otter, bobcat, fisher, or marten were required to present these animals at a DNR office for registration. Prior to 2003, furtakers were also required to register badger; however, this requirement was eliminated in 2003. In this report, marten harvest was determined only by registration.

During recent years, all licensed furtakers attempting to harvest bobcat, fisher, marten, and otter in Michigan were required to obtain a free harvest tag from the DNR. The list of furtakers obtaining these harvest tags formed a complete list of trappers statewide pursuing these species. Using these lists, the DNR was able to design separate harvest surveys that provided more precise estimates (i.e., narrower confidence intervals) than previous harvest from surveys of all furtakers. Separate surveys were conducted to estimate furtaker participation, harvest, and effort for bobcat (Frawley 2011c), fisher and marten (Frawley 2011a), and otter (Frawley 2011b) seasons during recent years.

Although furtakers that purchased a small game hunting license could harvest coyotes without a fur harvester's license; these license buyers were not included in this survey. Rather, a separate survey was conducted to estimate the harvest of coyotes taken by small game hunting license buyers (e.g., Frawley 2008b).

While the primary objectives of the fur harvester's survey were estimating harvest, number of participants, and trapping and hunting effort, this survey also provided an opportunity to collect information about management issues. Questions were added to the questionnaire to determine whether trappers had used cable restraints (snares) while attempting to capture coyote or fox during 2008 seasons. If trappers reported that a coyote had escaped from their cable restraints, these trappers were asked to report the primary reason why coyotes had escaped. Trappers also were asked whether they had placed body-gripping traps (e.g., conibears) having a jaw spread of at least six inches on dry land or set them less than four feet above the ground. If these traps had been used, these trappers were asked what species they intended to catch. In addition, trappers were asked to report the average number of traps set daily for furbearers.

Questionnaires were mailed initially in late May 2009. Up to two follow-up questionnaires were sent to non-respondents. Questionnaires were undeliverable to 65 people, primarily because of changes in residence. Questionnaires were returned by 2,659 people, yielding a 64% adjusted response rate.

RESULTS AND DISCUSSION

In 2008, 24,338 fur harvester licenses were purchased by 24,071 people (Figure 2, Table 2). The number of license buyers in 2008 was 1% lower than in 2007. Most license buyers were men (98%), with an average age of 45 years (Figure 3). About 6% of the license buyers (1,539) were younger than 17 years of age.

Mail Harvest Survey

Overall, approximately 57% of license buyers either hunted or trapped furbearers during 2008 (Table 3). The number of active furtakers decreased 4% from 2007, although the change was not statistically significant. About 31% of the license buyers trapped and 40% hunted furbearers during 2008. Trappers most often pursued raccoons, muskrat, and coyote (Table 4). Hunters most commonly sought coyotes, raccoon, and red fox. Coyotes and raccoons ranked as the most frequently sought furbearers when trappers and hunters were combined.

Although the estimated trapper numbers were similar during 2007 and 2008 (Table 3), the number of trappers during recent years is well below the record highs of nearly 16,000 in the early 1980s (Figure 4). The peaks in furtaker numbers corresponded closely to periods when pelt values peaked for many species such as muskrat, raccoon, and red fox (Iowa Department of Natural Resources 2002). The number of trappers during recent years has been comparable to the numbers active during the 1960s, prior to the peak in fur prices. The

estimated number of people hunting furbearers was not significantly different between 2007 and 2008 (Table 3). Since 1999, the number of people hunting furbearers has been consistently greater than the number of people trapping (Figure 4).

Collectively, about the same number of people trapped furbearers in 2008 compared to 2007. Moreover, similar numbers of trappers pursued most species, except for mink and bobcats (Table 4). Mink had fewer trappers seeking them in 2008 than 2007, and bobcats had more trappers targeting them in 2008. Overall, similar numbers of people hunted furbearers in 2008 than 2007; however, fewer hunters sought bobcats. Changes for hunting and trapping effort and harvest between 2007 and 2008 generally followed changes in the number of furtakers.

Harvest of muskrat, mink, red fox, beaver, bobcat, fisher, and otter in 2008 were near the low end of their historical ranges (Figures 5-7). In contrast, harvest of coyote was near the high end of its historical range. Many factors influence harvest trends such as hunter numbers, wildlife population size, hunting regulations, habitat conditions, and fur prices; thus, any interpretations of trends should be viewed cautiously. Trends in harvest per furtaker (Figures 8 and 9) were examined because this measure may eliminate some of the effects of changing furtaker and furbearer numbers over time, although many other factors may still complicate interpretations of these trends (Poole and Mowat 2001).

The mean number of raccoon and opossum taken per furtaker has generally increased since the early 1980s (Figures 8 and 9). The mean harvest of red fox by both hunters and trappers has declined since the mid-1980s. These trends suggest raccoon and opossum may have been increasing in abundance during the last 20 years, while red fox numbers may have been declining.

These trends in furbearer numbers are not unique to Michigan. Increasing raccoon numbers have also been reported in Illinois since the 1980s (Gehrt et al. 2002). Furthermore, declining red fox numbers have been reported in portions of the northern Great Plains since the 1980s (Sovada et al. 1995). The decline in red fox numbers in the northern Great Plains during recent years has been attributed largely to competition from increased coyote numbers (Sovada et al. 1995).

The mean harvest of fisher per trapper has declined during the last ten years (Figure 8). Frawley (2011a) reported increasing effort expended by trappers for each fisher registered during the last ten years. Both the declining mean harvest of fisher per trapper and the increasing effort per registered fisher suggest fisher numbers may have declined over the last ten years.

The mean number of bobcats taken per trapper declined from 2003 to 2008 (Figure 8). The seasonal harvest limit for bobcats was lowered from three to two bobcats in 2004, and this reduction probably contributed to the decline of bobcats taken per trapper since 2003 (Frawley 2011c).

Registration Data

Compared to 2007, more fisher (28% increase), otter (7%), and bobcat (2%) were registered in 2008; however, fewer marten (-9% decline) were registered (Figure 10, Table 5). Registration totals included only animals legally harvested by furtakers during hunting and trapping seasons. Also, registration totals only included animals that were registered and returned to the furtaker.

Supplemental Questions

Foothold traps were the most common type of trap used by trappers in 2008 (Table 6). An estimated 80% of trappers used foothold traps, and these trappers set an average of 18 foothold traps per day. About 71% of trappers used body-gripping traps (e.g., conibears), and these trappers set an average of 15 traps per day. Cable restraints (snares) were used by about 15% of trappers, and colony traps were used by nearly 9% of trappers. These trappers set an average of 11 and 6 traps per day, respectively.

Trappers were prohibited from setting body-gripping traps (e.g., conibears) larger than six inches in width on dry lands that were publicly owned, or over frozen submerged publicly owned bottomlands or on commercial forest lands unless the trap was four feet or more above the ground or placed in a container inaccessible to dogs. Body-gripping traps set on private lands were not restricted by these regulations. An estimated 36% of trappers set body-gripping traps having a jaw spread of 6-8 inches in width on dry lands or set them within four feet of the ground (Table 7). Most of these sets were constructed to catch raccoon.

An estimated 89% of trappers that tried to catch coyote or fox used foothold traps (Table 8, 3,328 trappers). About 28% of coyote and fox trappers used cable restraints in their attempt to catch coyote or fox (1,032 trappers). An estimated 2,885 coyote trappers caught 7,359 coyotes with foothold traps, while 2,594 fox trappers caught 5,571 fox with foothold traps (Table 9). These trappers also reported 1,455 coyotes and 841 fox escaping from foothold traps. Among trappers using cable restraints, 996 trappers caught 1,090 coyotes, and 473 trappers caught 392 fox. In addition, trappers reported 1,284 coyotes and 432 fox escaping from cable restraints. Among coyote trappers that reported coyote escaping from their cable restraints, most coyotes (738 of 1,284) escaped because they slipped out of the cable restraint (Table 10).

ACKNOWLEDGEMENTS

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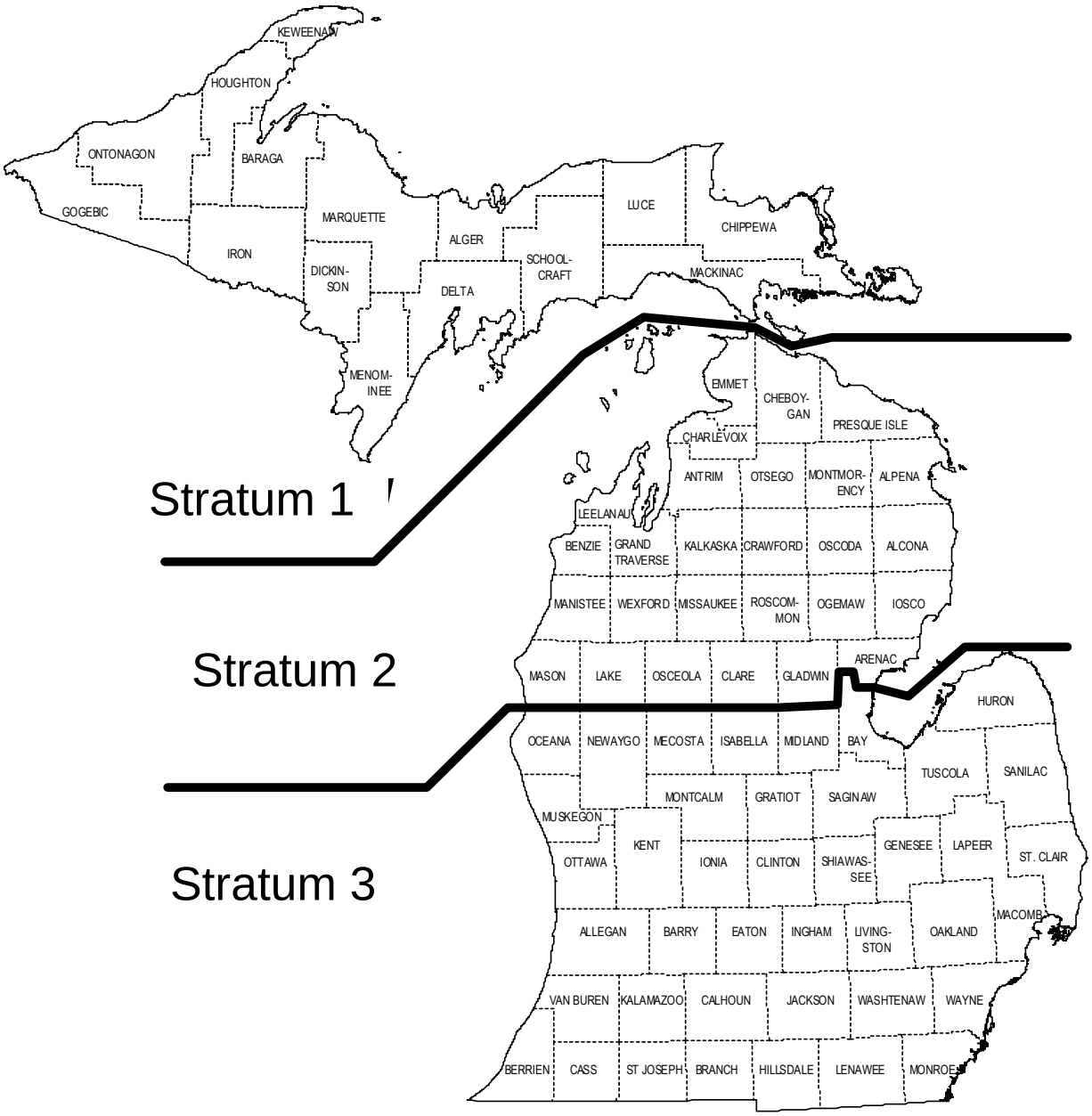


Figure 1. Stratum boundaries used for the analysis of the Michigan furbearer harvest survey. Nonresidents were included as a fourth stratum.

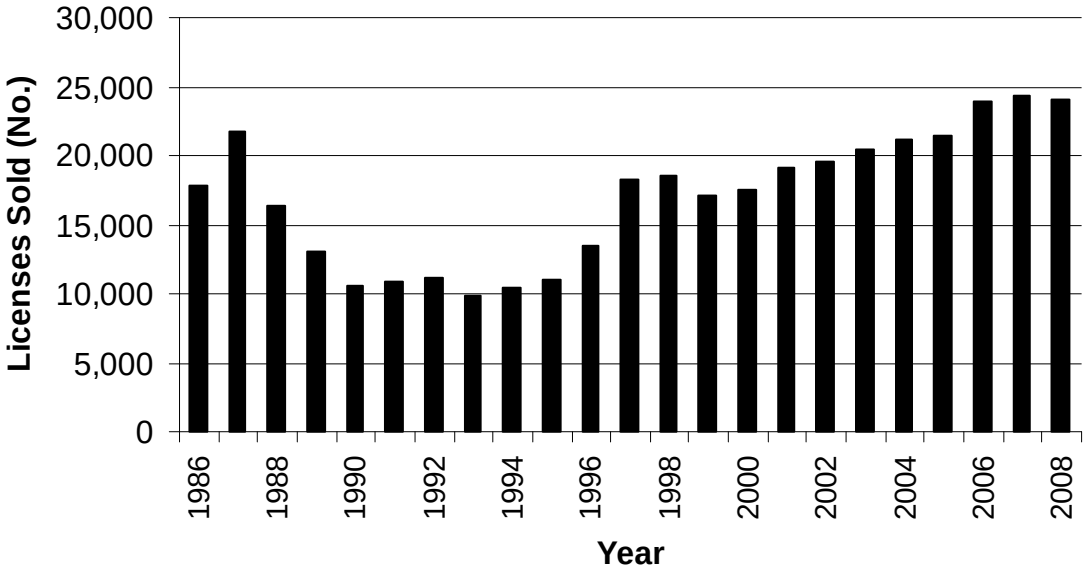


Figure 2. Number of fur harvester licenses sold in Michigan, 1986-2008. Fur harvester licenses included Resident Fur Harvester, Senior Fur Harvester, Junior Fur Harvester, Military Fur Harvester, and Nonresident Fur Harvester licenses. During 1996-2008, totals also included Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses.

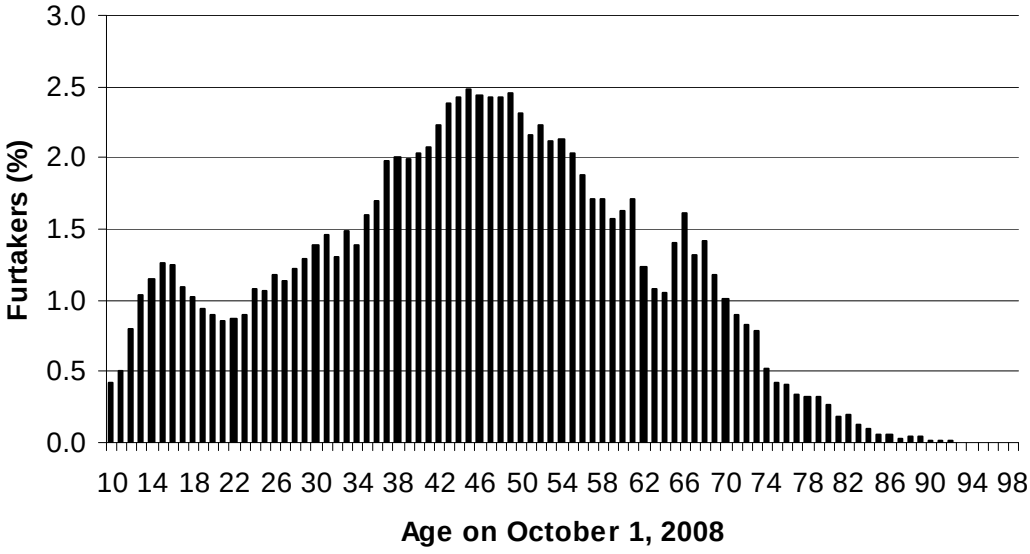


Figure 3. Ages of people that purchased a license to hunt or trap furbearers in Michigan for the 2008 hunting and trapping seasons ($\bar{x}$ = 45 years).

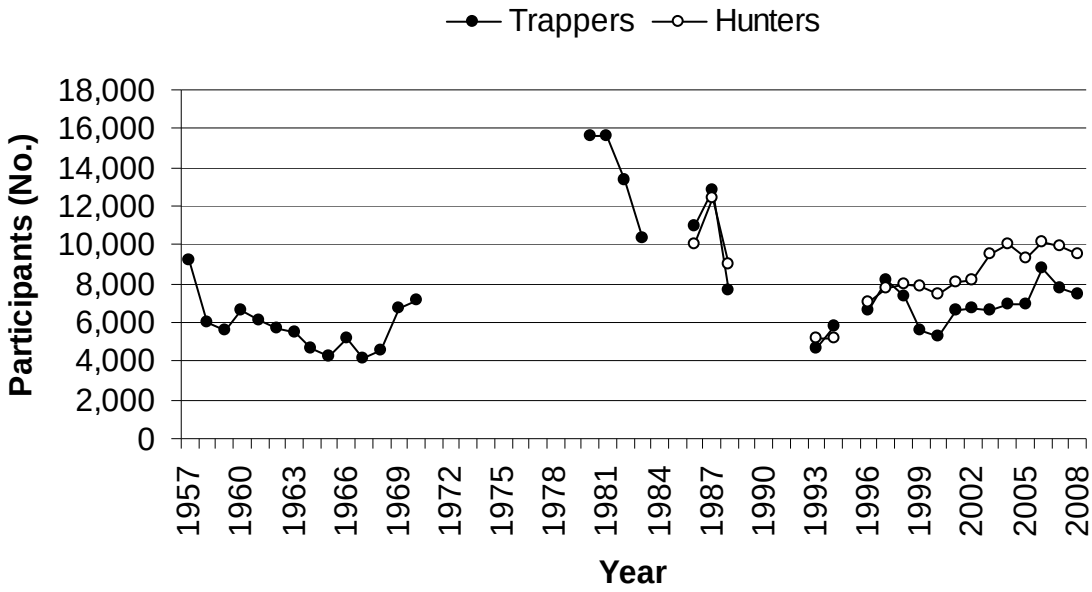


Figure 4. Estimated number of trappers and hunters in Michigan, 1957-2008. Estimates included only license buyers that actually trapped or hunted furbearers (any species). Data were not available for all years.

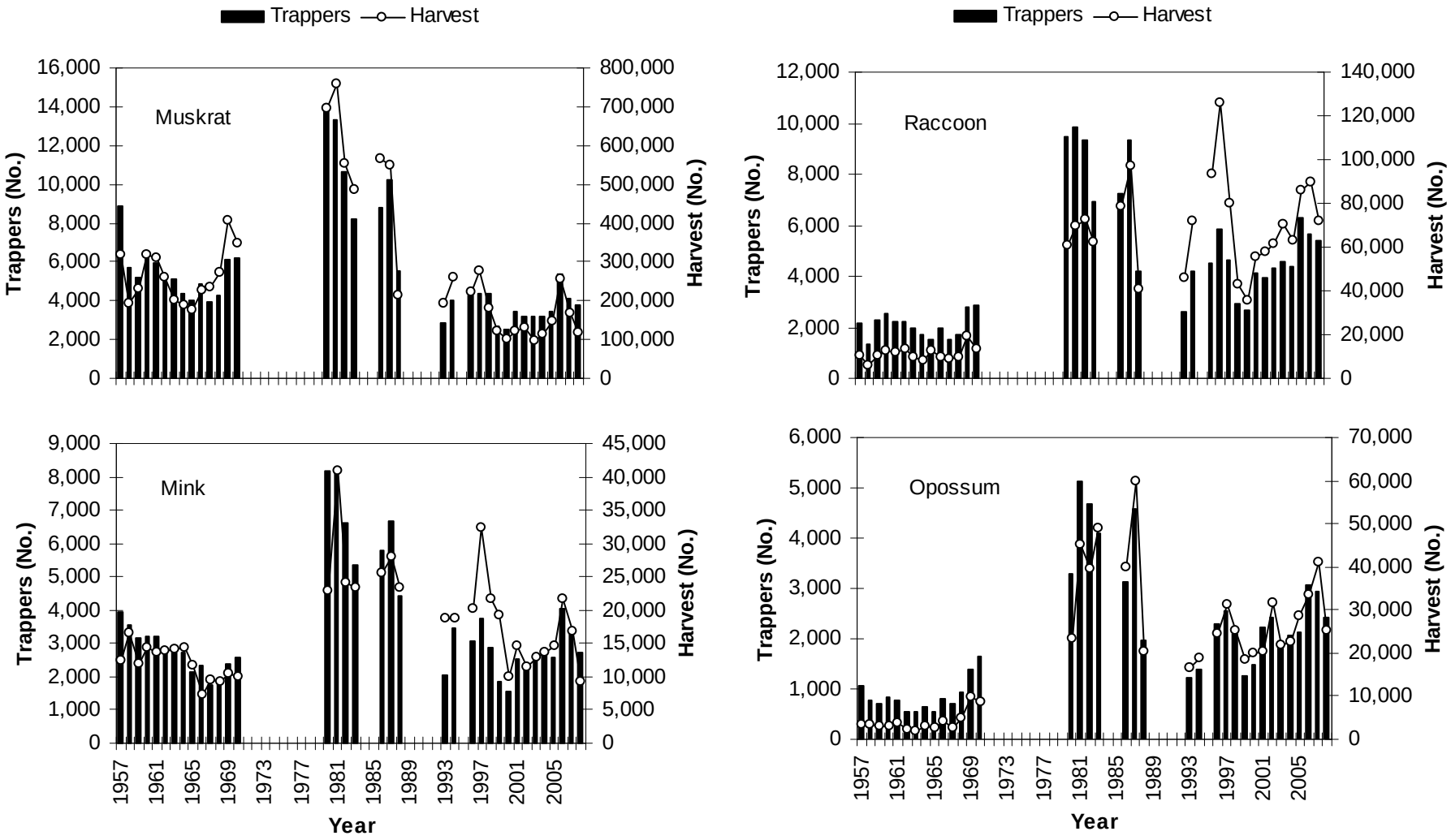
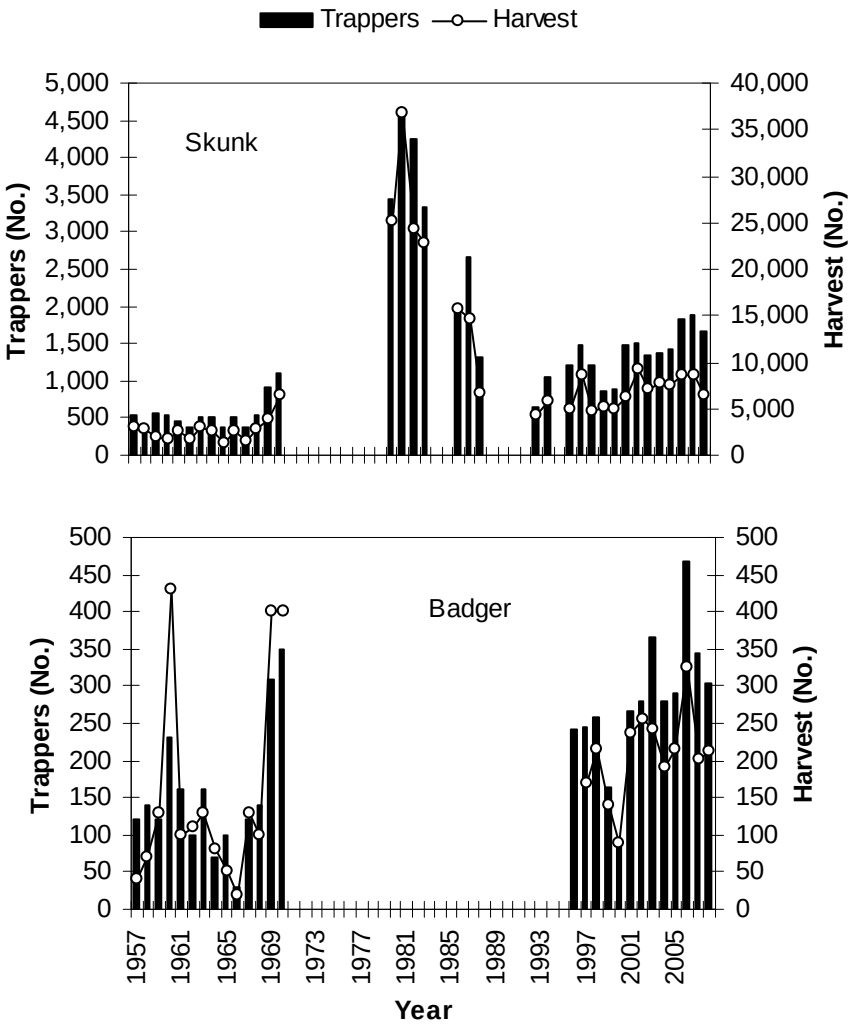
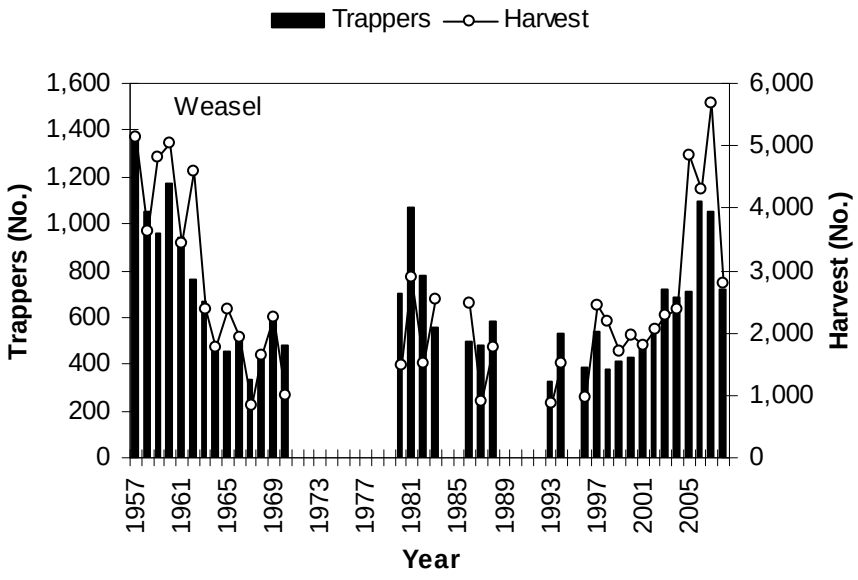


Figure 5. Estimated furbearer harvest by trappers and the number of trappers in Michigan estimated from mail harvest surveys, 1957-2008. Mail survey questionnaires were sent to a random sample of Trapping license buyers during 1957-1969. The sample also included Sportsman's license buyers in 1970-1972. During 1980-1983, the sample included Trapping and Senior Hunting license buyers. During 1986-2008, the sample was selected from people buying either Resident Fur Harvester, Senior Fur Harvester, Junior Fur Harvester, Military Fur Harvester, or Nonresident Fur Harvester licenses. The sample also included Senior Hunting license buyers during 1986-1988. Starting in 1996, samples also included people buying Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses. Data were not available for all years.





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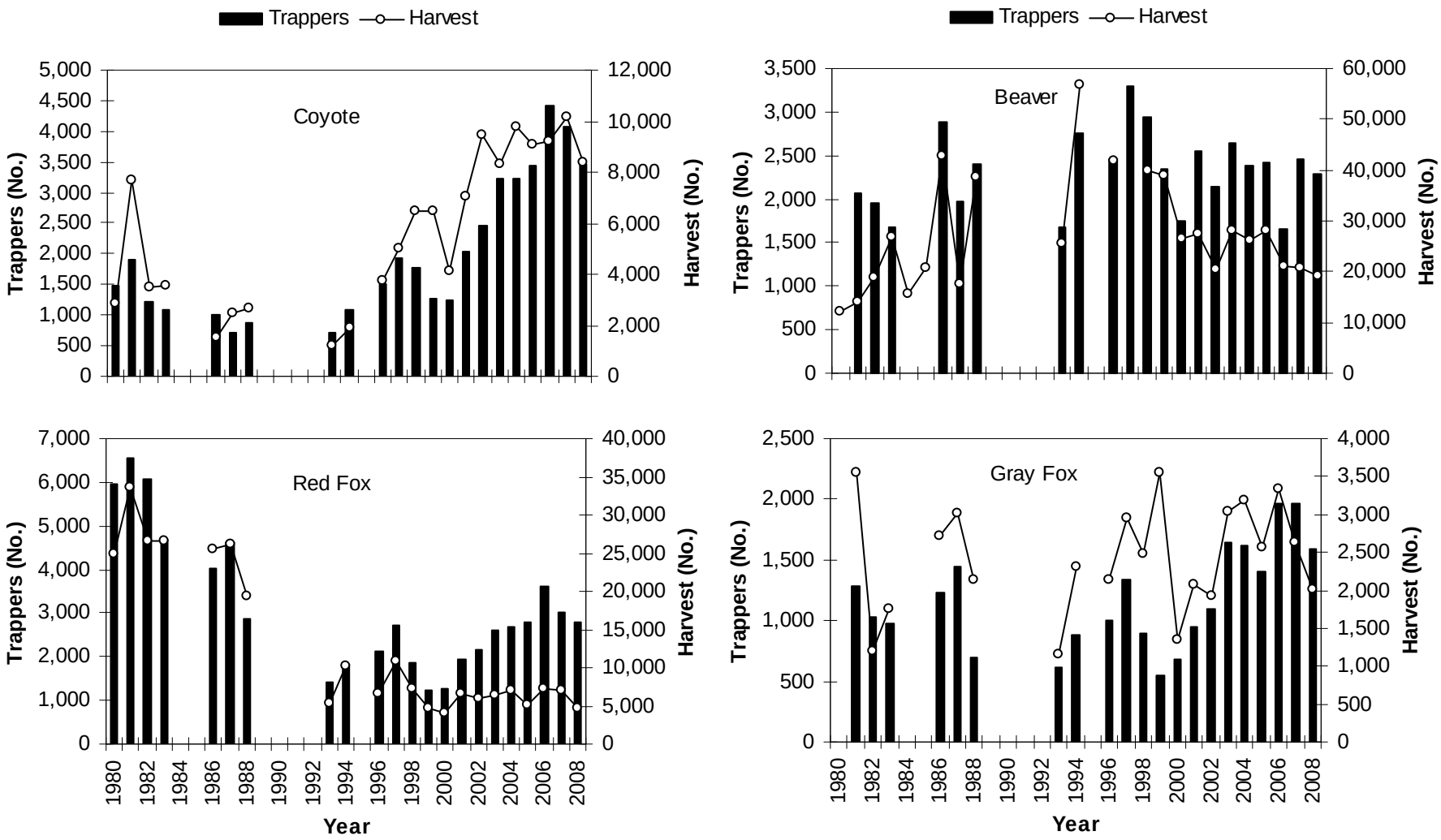

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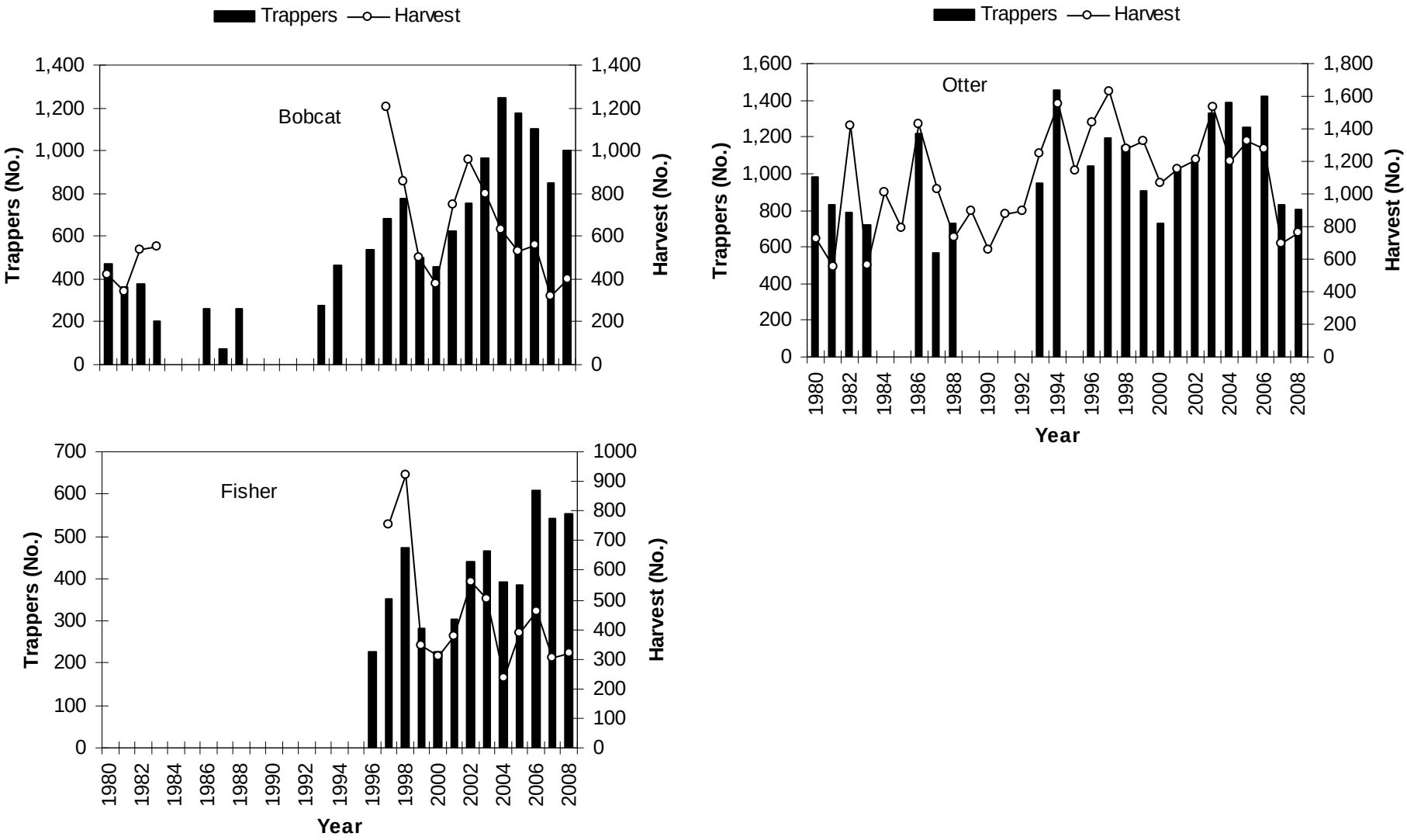

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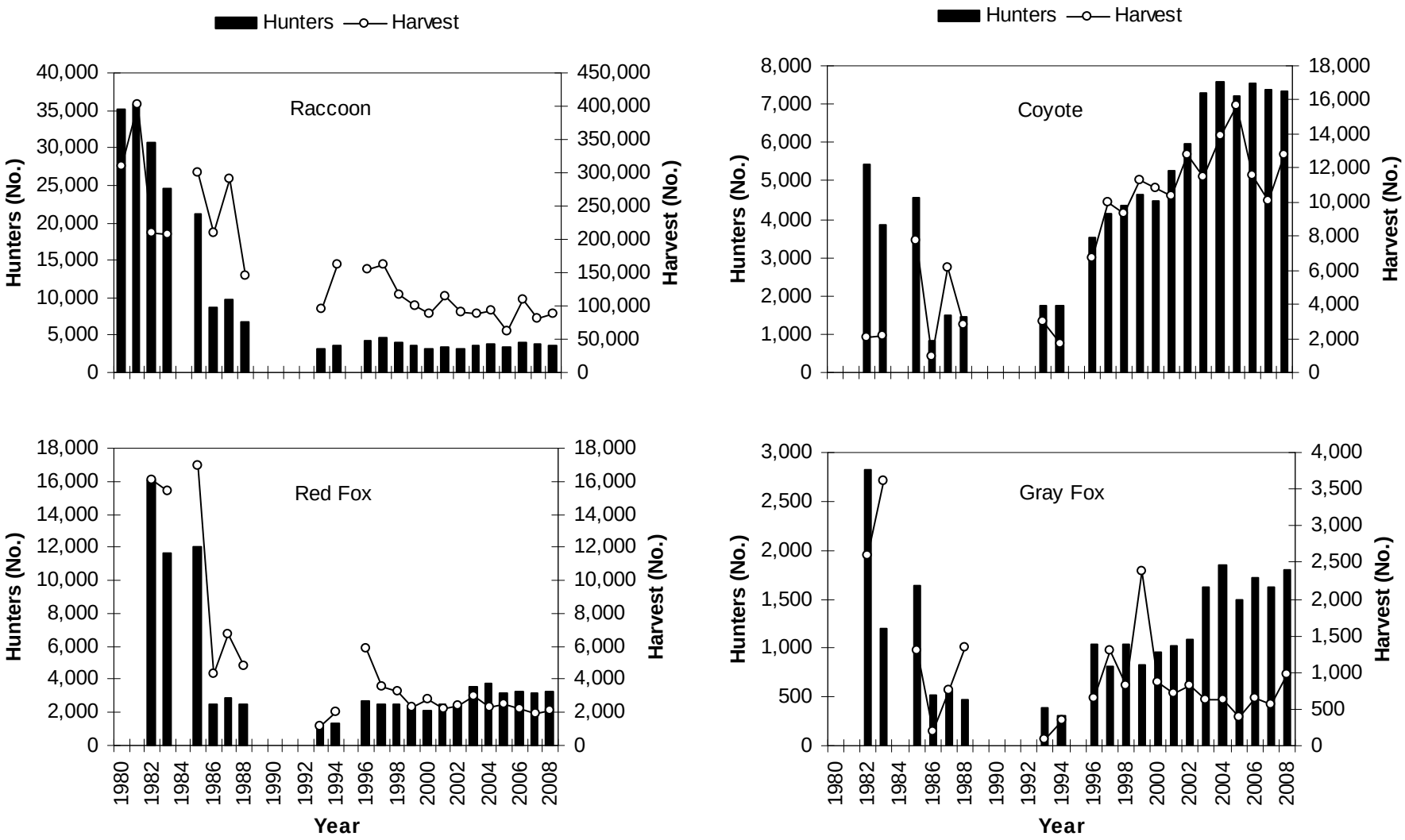
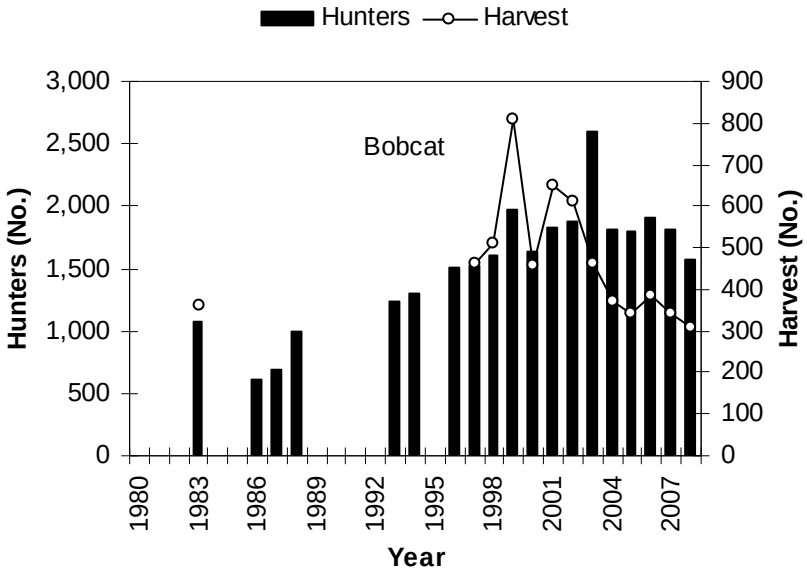


Figure 7. Estimated furbearer harvest by hunters and the number of hunters in Michigan estimated from mail harvest surveys, 1980-2008. The mail survey was sent to a random sample of people buying either small game licenses, Senior Hunting licenses, or Sportsman's licenses during 1980-1985. During 1986-2008, the sample was selected from people buying either Resident Fur Harvester, Senior Fur Harvester, Junior Fur Harvester, Military Fur Harvester, or Nonresident Fur Harvester licenses. The sample also included Senior Hunting license buyers during 1986-1988. Starting in 1996, samples also included people buying Resident Fur Harvester (trap only) and Junior Fur Harvester (trap only) licenses. Data were not available for all years.



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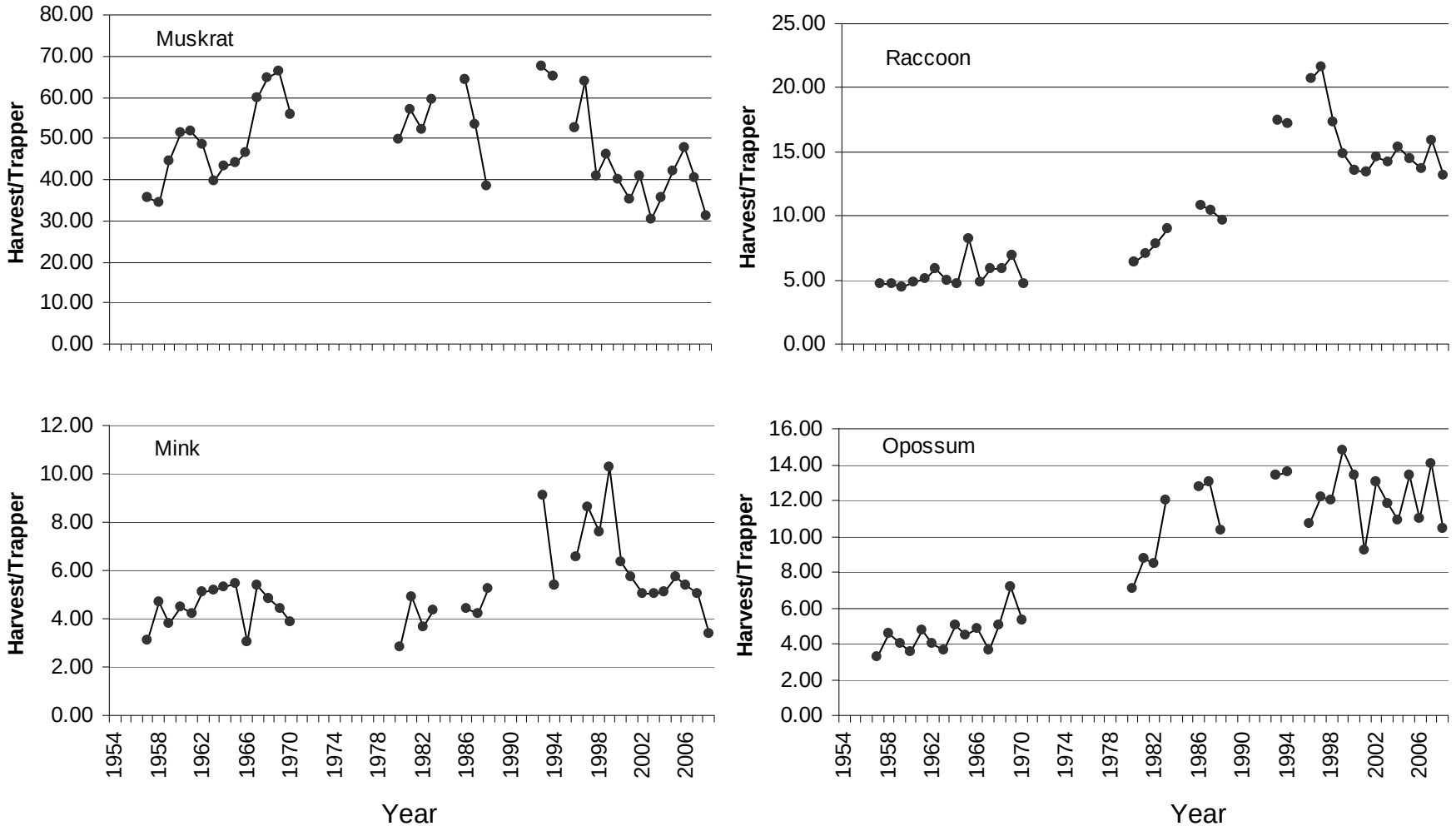
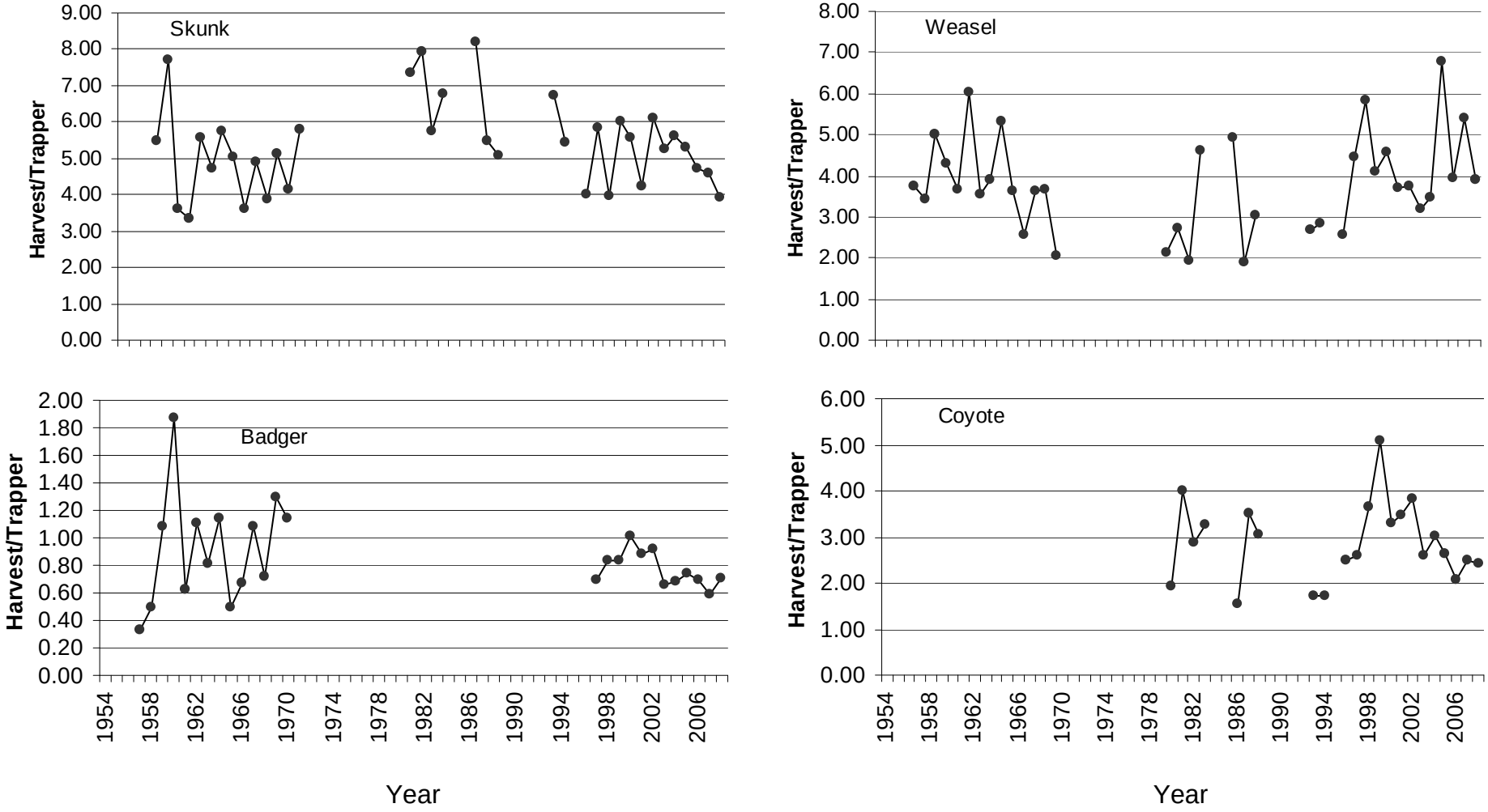


Figure 8. Estimated mean number of furbearers harvested annually by trappers in Michigan estimated from mail harvest surveys, 1954-2008. Data were not available for all years.



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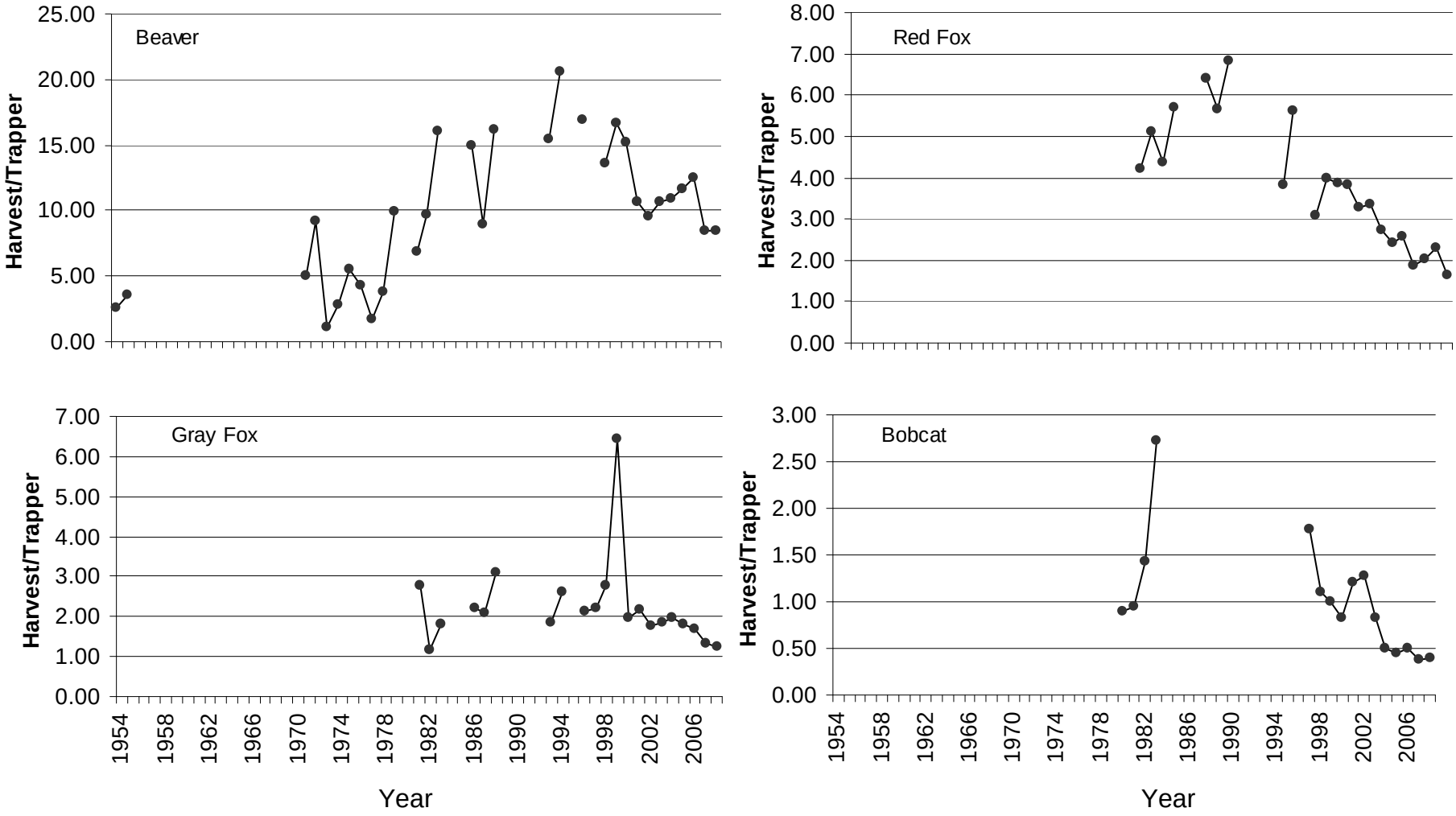

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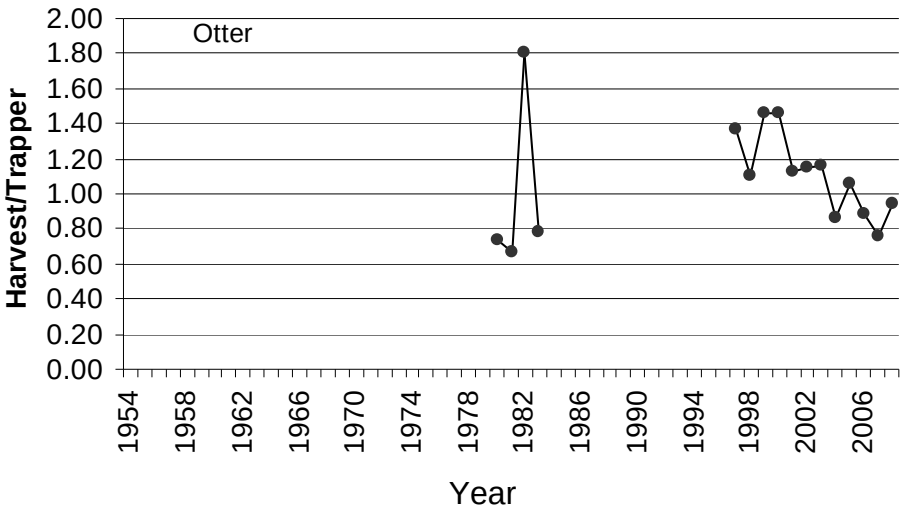

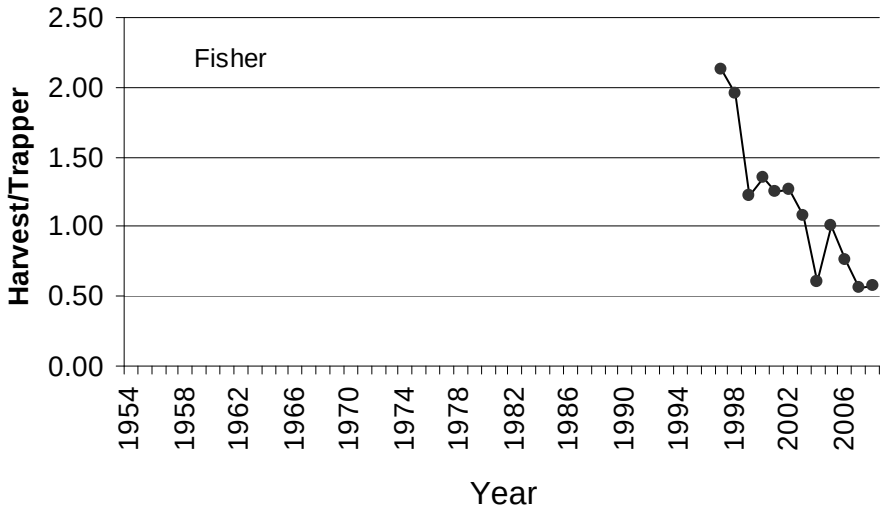

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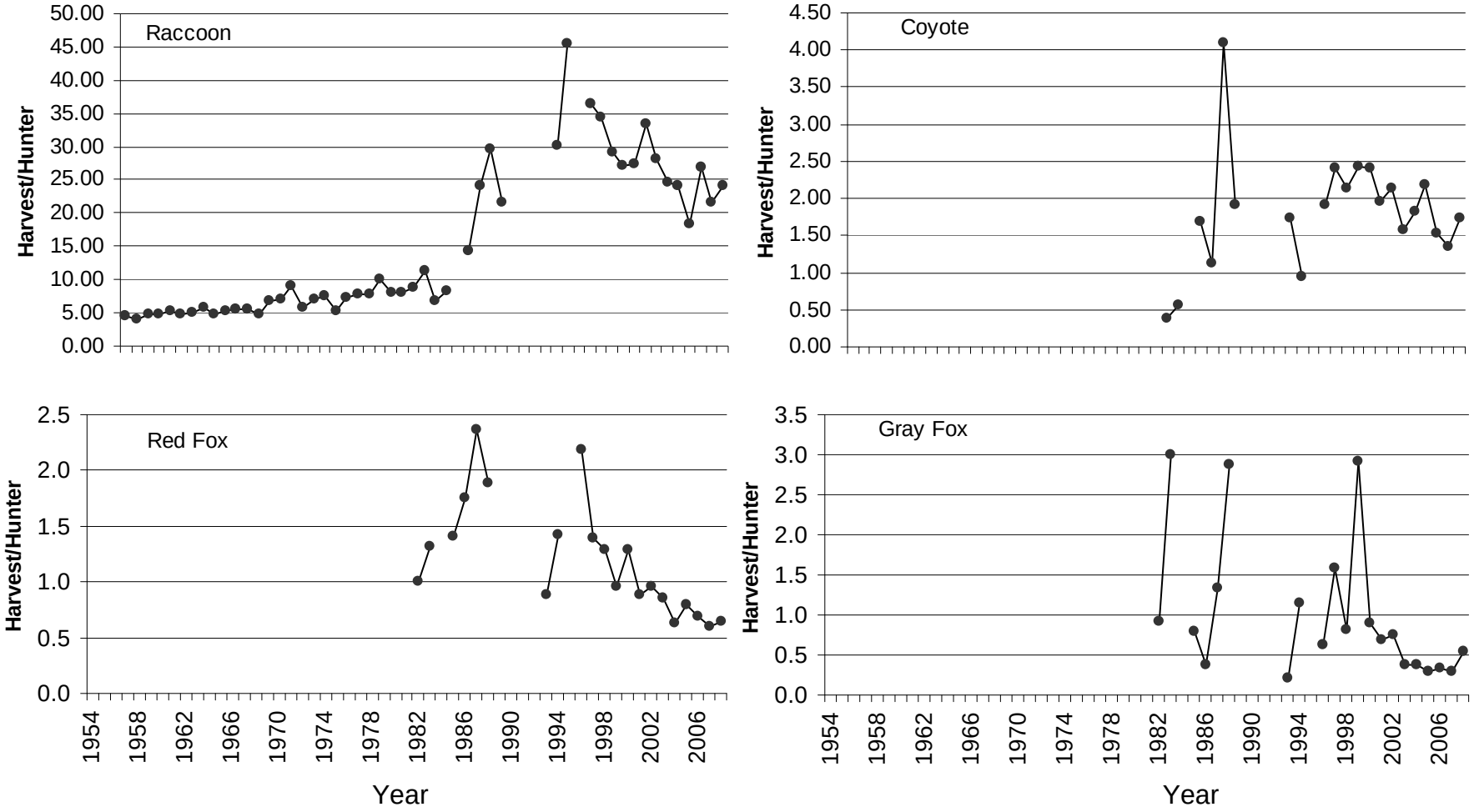

Figure 9. Estimated mean number of furbearers harvested annually by hunters in Michigan estimated from mail harvest surveys, 1954-2008. Data were not available for all years.

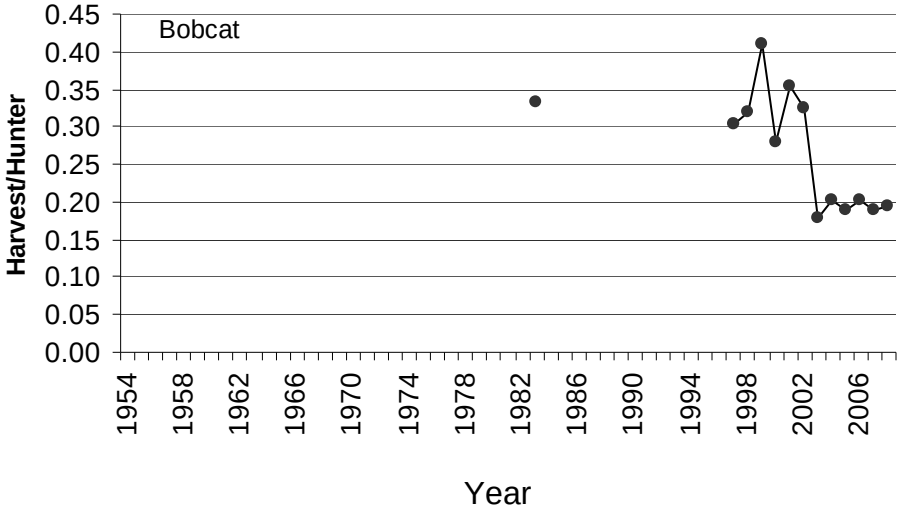

Figure 9 (continued). Estimated mean number of furbearers harvested annually by hunters in Michigan estimated from mail harvest surveys, 1954-2008. Data were not available for all years.

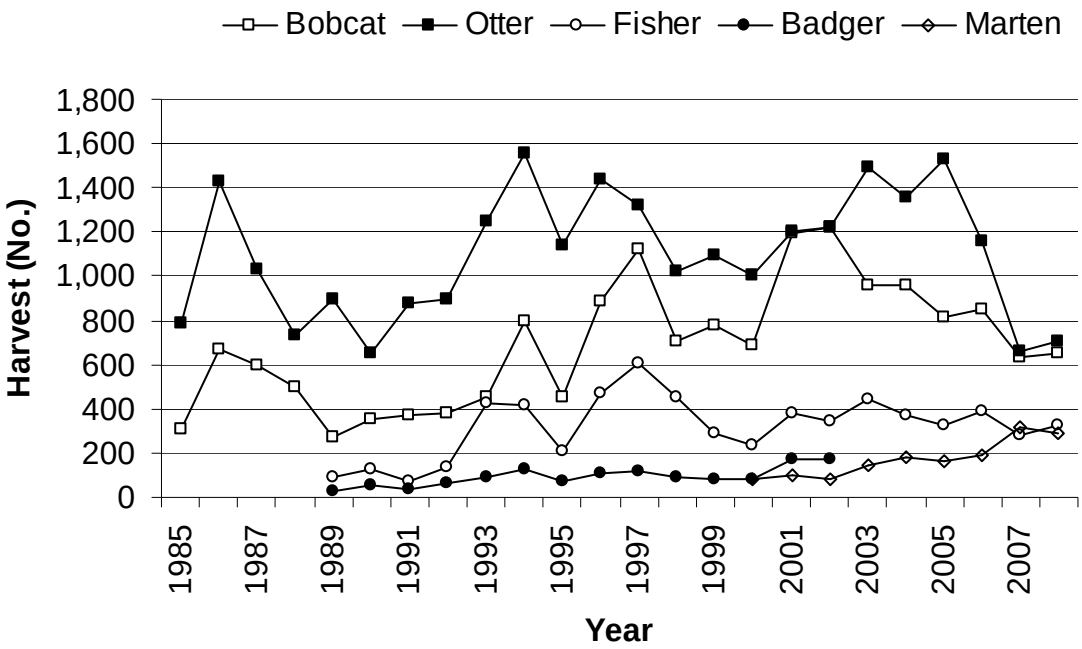

Figure 10. Number of bobcat, otter, fisher, badger, and marten registered by furtakers in Michigan, 1985-2008. Badger and fisher seasons were established in 1989, and marten season started in 2000. Totals for 2008 were preliminary. Beginning in 2003, badger were no longer registered.

Table 1. Trapping and hunting seasons when furbearing animals could be harvested in Michigan during 2008 seasons.[a]

Season, species, and area	Season dates
Trapping seasons[b]	
Muskrat and Mink	
UP	October 25 – January 31
NLP	November 1 – January 31
SLP	November 10 – January 31
Raccoon	
UP and NLP	October 15 – January 31
SLP	November 1 – January 31
Fox and Coyote	
Statewide	October 15 – March 1
Bobcat	
UP	October 25 – March 1
NLP	December 10 – 20
Badger	
UP and NLP	October 15 – November 14
SLP	November 1 – March 1
Fisher and Marten	
UP	December 1 – 15
Beaver and Otter[c]	
UP	October 25 – April 12
NLP	November 1 – April 12
SLP	November 10 – March 31
Hunting seasons	
Bobcat	
UP	December 1 – March 1
NLP (northern portion)	January 1 – March 1
NLP (southern portion)	January 1 – February 1
Fox	
Statewide	October 15 – March 1
Raccoon	
Statewide	October 1 – January 31
Coyote	
Statewide[d]	July 15 – April 15

[a]No closed season for opossum, weasel, and skunk.
[b]Nonresidents may trap from November 15 through the regular season closing date, except for beaver. The opening date for nonresident beaver trapping varied by area.
[c]Resident seasons only. Nonresident season occurred during November 15-April 12 (UP), November 24- April 12 (NLP), and December 15 – March 31 (SLP).
[d]Season closed during firearm deer season (November 15-30) in the UP and NLP.

Table 2. Number of fur harvester licenses sold and people receiving and returning harvest questionnaire, 2005-2008.

	Year			
Item	2005	2006	2007	2008
Licenses sold	21,680	24,149	24,617	24,338
Individuals buying licenses[a]	21,406	23,844	24,296	24,071
Questionnaires mailed	3,998	4,000	4,196	4,196
Non-deliverable questionnaires	66	79	60	65
Questionnaires returned	2,637	2,580	2,531	2,659
Questionnaires returned (%)[b]	67	66	61	64

[a]A person was counted only once, regardless of how many licenses they purchased. License types included Fur Harvester, Junior Fur Harvester, Senior Fur Harvester, Non-resident Fur Harvester, Military Fur Harvester, Resident Fur (trap only), and Junior Fur (trap only).
[b]Response rate adjusted to exclude non-deliverable questionnaires.

Table 3. Estimated number of fur harvester license buyers who trapped or hunted furbearers in Michigan, 2005-2008.

	2006		2007		2008		
Activity	Estimate	95% CL	Estimate	95% CL	Estimate	95% CL	Change between 2007 and 2008 (%)
Trapped							
Number	8,793	418	7,763	410	7,478	398	-4
%	37	2	32	2	31	2	-1
Hunted							
Number	10,183	430	9,897	431	9,529	420	-4
%	43	2	41	2	40	2	-1
Trapped or hunted[a]							
Number	15,051	420	14,321	433	13,776	427	-4
%	63	2	59	2	57	2	-2
Trapped only							
Number	4,868	350	4,424	339	4,247	328	-4
%	20	1	18	1	18	1	-1
Hunted only							
Number	6,258	381	6,558	389	6,297	377	-4
%	26	2	27	2	26	2	-1
Trapped and hunted							
Number	3,925	323	3,339	303	3,231	294	-3
%	16	1	14	1	13	1	<1

[a]A person was counted only once, although they may have both trapped and hunted furbearers.
*Non-overlapping 95% confidence intervals indicated estimates differed significantly between 2007 and 2008 ($P<0.005$).

Table 4. Estimated number of participants, harvest, and days afield during Michigan furbearer seasons, 2007 and 2008.

Species and season	Participants (No.) Year 2007	Year 2008	95% CL[a]	Change (%)	Harvest (No.) Year 2007	Year 2008	95% CL[a]	Change (%)	Days afield (No.) Year 2007	Year 2008	95% CL[a]	Change (%)
Trapping												
Mink	3,333	2,710	273	-19*	16,798	9,220	1,855	-45	89,538	62,926	8,807	-30*
Raccoon	5,652	5,420	360	-4	89,953	71,552	9,361	-20	151,654	133,185	12,934	-12
Opossum	2,934	2,427	258	-17	41,077	25,391	5,049	-38	78,204	61,195	9,166	-22
Skunk	1,886	1,662	218	-12	8,692	6,501	1,481	-25	49,273	40,441	7,572	-18
Weasel	1,055	719	145	-32	5,686	2,805	1,189	-51	32,340	19,965	5,622	-38
Red fox	2,999	2,805	277	-6	6,942	4,580	1,073	-34	77,722	73,473	10,042	-5
Gray fox	1,964	1,597	214	-19	2,636	2,019	474	-23	53,163	42,663	7,962	-20
Coyote	4,081	3,464	303	-15	10,179	8,394	1,807	-18	104,689	87,260	10,772	-17
Bobcat[b]	850	1,001	42	18*	320	401	36	25*	24,848	21,978	1,586	-12
Beaver[c]	2,449	2,290	251	-7	20,765	19,244	4,110	-7	60,603	49,468	8,759	-18
Muskrat	4,143	3,751	313	-9	167,359	117,221	20,887	-30	110,871	87,513	10,702	-21
Otter[c]	833	808	36	-3	700	763	54	9	15,802	14,439	1,258	-9
Fisher[d]	544	552	26	1	306	318	31	4	5,900	5,766	330	-2
Badger	345	304	95	-12	203	213	83	5	6,437	4,751	2,230	-26
Hunting												
Raccoon	3,777	3,633	307	-4	81,553	87,254	18,834	7	75,113	70,781	10,079	-6
Red fox	3,139	3,249	294	3	1,899	2,087	562	10	44,392	38,167	5,875	-14
Gray fox	1,628	1,805	227	11	572	969	498	69	26,628	22,151	4,853	-17
Coyote	7,364	7,320	397	-1	10,040	12,747	2,451	27	101,290	93,436	10,146	-8
Bobcat[b]	1,805	1,569	48	-13*	340	306	27	-10	19,096	16,972	943	-11*
Trapping and hunting combined												
Raccoon	8,106	7,765	403	-4	171,506	158,806	22,203	-7	226,767	203,967	17,728	-10
Red fox	5,335	5,372	359	1	8,841	6,667	1,238	-25	122,115	111,640	11,909	-9
Gray fox	3,126	3,059	287	-2	3,208	2,988	757	-7	79,792	64,814	9,510	-19
Coyote	9,709	9,290	420	-4*	20,219	21,142	3,144	5	205,979	180,697	15,387	-12
Bobcat[b]	2,462	2,358	48	-4*	660	707	44	7	43,943	38,950	1,792	-11*

[a]95% CL for the 2008 estimate.
[b]Bobcat estimates from separate mail harvest survey (Frawley 2011c). See Table 5 for registration totals.
[c]Otter estimates from separate mail harvest survey (Frawley 2011b). See Table 5 for registration totals.
[d]Fisher estimates from separate mail harvest survey (Frawley 2011a). See Table 5 for registration totals.
*Non-overlapping 95% confidence intervals indicated estimates differed significantly between 2007 and 2008 (P<0.005).

Table 5. Number of bobcat, otter, fisher, badger and marten registered by furtakers in Michigan, 1985-2008.[a]

	Species							
	Bobcat (by method of capture)							
Year	Hunting	Trapping	Unknown	Total	Otter	Fisher[a]	Badger[b,c]	Marten[d]
1985	193	100	14	307	791			
1986	268	390	11	669	1,431			
1987	315	277	5	597	1,030			
1988	327	170	0	497	731			
1989	178	91	0	269	900	94	28	
1990	266	85	0	351	654	125	52	
1991	292	79	0	371	877	68	35	
1992	276	104	0	380	896	139	63	
1993	285	163	0	448	1,252	425	90	
1994	373	422	0	795	1,552	417	124	
1995	311	137	1	450	1,143	210	75	
1996	463	420	0	883	1,438	471	109	
1997	347	771	0	1,118	1,324	609	117	
1998	331	375	0	706	1,026	455	91	
1999	434	343	0	777	1,097	291	82	
2000	379	307	0	686	1,006	236	85	85
2001	465	727	0	1,192	1,204	381	174	97
2002	482	741	0	1,223	1,221	348	173	85
2003	340	621	0	961	1,496	442		149
2004	321	637	0	958	1,358	368		184
2005	309	508	0	817	1,526	322		164
2006	336	515	0	851	1,154	390		192
2007	336	299	0	632	663	280		316
2008[e]	284	364	0	648	707	326		290

[a]Registration totals included only animals legally harvested by furtakers during hunting and trapping seasons. Also, totals only included animals that were registered and returned to the furtaker.
[b]Badger and fisher seasons were established in 1989.
[c]Furtakers no longer were required to register badgers beginning in 2003.
[d]Marten season was established in 2000.
[e]Preliminary totals.

Table 6. Proportion of active trappers using various types of traps and mean number of traps set per day in 2007 and 2008.

	Year							
	2007				2008[a]			
	Trappers		Traps set per day[a]		Trappers		Traps set per day[a]	
Trap type	%	95% CL	Mean	95% CL	%	95% CL	Mean	95% CL
Foothold traps	83.2	2.5	18.7	1.9	80.3	3.0	17.5	1.9
Body-gripping traps (conibears)	70.2	3.1	16.5	1.7	71.0	3.0	15.1	1.6
Cable restraints (snares)	17.1	2.6	10.3	1.9	14.6	2.0	10.8	1.8
Colony traps[b]	14.7	2.4	7.5	2.8	9.3	2.0	5.5	1.1

[a]Mean number of traps used among trappers that reported using these trap types.
[b]Colony traps allow the capture of multiple muskrats in one trap.
*Non-overlapping 95% confidence intervals indicated estimates declined significantly between 2007 and 2008 ($P<0.005$).

Table 7. Proportion and total number of trappers using body-gripping traps (e.g., conibear) having a jaw spread of 6-8 inches on dry land or set less than four feet above the ground in 2008.[a]

Body-gripping traps used and target species	Number of trappers		Proportion of trappers	
	No.	95% CL	%	95% CL
Conibear 160 and equivalent traps[b]				
Bobcat	120	61	1.6	1.0
Marten	174	73	2.3	1.0
Fisher	211	80	2.8	1.0
Fox	36	33	0.5	<0.1
Raccoon	1,205	188	16.1	2.0
Subtotal (all species)	1,360	199	18.2	2.0
Conibear 220 and equivalent traps[c]				
Bobcat	147	67	2.0	1.0
Marten	74	48	1.0	1.0
Fisher	102	56	1.4	1.0
Fox	83	51	1.1	1.0
Raccoon	1,610	216	21.5	3.0
Subtotal (all species)	1,703	221	22.8	3.0
Conibear 280 and equivalent traps[d]				
Bobcat	73	48	1.0	1.0
Marten	27	29	0.4	<0.1
Fisher	37	34	0.5	<0.1
Fox	45	37	0.6	<0.1
Raccoon	172	73	2.3	1.0
Subtotal (all species)	254	88	3.4	1.0
Grand total (all traps and species)	2,689	272	36.0	3.0

[a]Trappers were prohibited from setting body-gripping traps larger than six inches in width on dry lands that were publicly owned, or over frozen submerged publicly owned bottomlands or on commercial forest lands unless the trap was four feet or more above the ground or placed in a container inaccessible to dogs.
[b]Body-gripping traps approximately six inches wide.
[c]Body-gripping traps approximately seven inches wide.
[d]Body-gripping traps approximately eight inches wide.

Table 8. Estimated coyote and fox trappers using foothold traps or snares to capture coyote and fox in Michigan during the 2008 season.[a]

	Trappers		Proportion of coyote and fox trappers	
Trap type	No.	95% CL	%	95% CL
Foothold traps	3,328	297	89	3
Cable restraints (snares)	1,032	175	28	4
Either foothold traps or cable restraints	3,754	313	100	0
Foothold traps only	2,721	273	72	4
Cable restraints only	426	114	11	3
Both foothold traps and cable restraints	606	135	16	3

[a]None of the 2008 estimates differed statistically from 2007 estimates (Frawley 2008).

Table 9. Estimated number of trappers using foothold traps and cable restraints (snares) to catch coyote and fox, trapping effort, mean number of traps set per day, number of animals captured, and number of animals escaping from traps in Michigan during 2008 season.[a]

	Trappers		Trapping effort (day)		Traps set per day		Animals caught		Animals that escaped	
Type of trapper	No.	95% CL	No.	95% CL	Mean	95% CL	No.	95% CL	No.	95% CL
Using foothold traps to catch coyote	2,885*	279	67,759	8,817	9.6	1.1	7,359	1,703	1,455*	424
Using foothold traps to catch fox	2,594	267	62,996	8,811	9.2	1.0	5,571	1,279	841	319
Using cable restraints to catch coyote	996	172	22,658	4,870	8.1	1.5	1,090	428	1,284	490
Using cable restraints to catch fox	473	120	11,397	3,522	8.2	1.7	392	226	432	294

*Non-overlapping 95% confidence intervals indicated estimates declined significantly between 2007 and 2008 (P<0.005).

Table 10. Estimated mean and total number of coyotes escaping from cable restraints (snares) in Michigan during the 2008 season, summarized by reason coyote escaped from snare.[a]

	Mean number of coyotes escaping		Total number of coyotes escaping	
Reason for escape	No.	95% CL	No.	95% CL
Slipped out of snare	0.74	0.31	738	335
Chewed through snare cable	0.10	0.10	100	103
Broke snare break-away device	0.36	0.21	363	216
Escaped because of another reason	0.08	0.06	82	66

[a]Analyses limited to coyote trappers that reported using snares.